

The Ballarat Naturalist

Volume 22 No.10

November 2022



Birds and Orchids and the Swamp Wallaby! October's Clarksdale Excursion

Sixteen field naturalists met Emily Noble at the Clare Miller Environment Centre at Clarksdale Bird Sanctuary for a day of wonderful sights and sounds on Sunday 9th October. The weather was ideal – not too hot, and no rain.

In preparation, Emily had sent out lists she has compiled of birds and indigenous plants seen at Clarksdale. 160 indigenous species of birds have been recorded in the sanctuary, plus 6 introduced species. Over 340 indigenous plant species grow in the sanctuary's remnant Plains Grassy Woodland, Grassy Dry Forest, Heathy Dry Forest, Valley Grassy Forest, and Creekline Herb-rich Woodland vegetation communities. The list of orchids found in the Sanctuary includes 50 species!



Emily started by giving us some idea of what we would see; the birds that are nesting, and the plants that are flowering. She told us the mistletoe birds had arrived a week before, which means the painted honeyeaters, which are a symbol of the Sanctuary, were expected in about 2 weeks as the mistletoe fruit ripens further.

Our morning walk was in the Bird Paddock. We saw the nesting spots used by sacred kingfishers, striated pardalotes, and grey goshawks. The goshawks build a new nest each year, high up in candlebark (*Eucalyptus rubida*) trees. We could see the tip of the tail of the nesting bird on this year’s nest (with the help of binoculars or camera zoom).

Our walk took us past patches of flowering lowland bird orchids (*Chiloglottis sp. aff. valida*), small spider orchids (*Caladenia parva*), yellow stars (*Pauridia vaginata*), early nancys (*Wurmbea dioica*) and creamy candles (*Stackhousia monogyna*). We were a bit difficult to round up at times. Emily called, “The spider orchids are in this direction!”, and the answer came, “But there’s a swamp wallaby over here!”

Emily pointed out the grassland species austral bears ears (*Cymbonotus preissianus*), austral bugle (*Ajuga australis*) and curved riceflower (*Pimelea curvifolia*). She also told us of sections of the Bird Paddock that were fortunately saved from non-indigenous re-vegetation efforts, when those efforts switched to the land around what is now the Environment Centre.

<i>Birds seen or heard in the morning included:</i>	
Red wattlebird	Grey goshawk
Striated pardalote	Pallid cuckoo
Little raven	Corella (long-billed and little)
Kookaburra	White-naped honeyeater
Magpie	Golden whistler
Grey shrikethrush	Black faced cuckoo shrike
Crimson rosella	Eastern yellow robin
Fantail cuckoo	Little pied cormorant
Rufous whistler	Pacific black duck
Sulphur crested cockatoo	Australian swamp hen
Mistletoe bird	Superb fairywren
Grey fantail	Masked lapwing
Thornbill	Welcome swallow

After lunch many of us continued by car along the Linton-Piggoreet Rd to the Jubilee Block, which is not connected to the rest of the sanctuary. For quite a few of us, this was our first visit to the site.

At the Jubilee Block we could hardly move for orchids! We saw many patches of nodding greenhoods (*Pterostylis nutans*), some dwarf greenhoods (*Pterostylis nana*), waxlips (*Glossidia major*) (below left), pink lady fingers (*Caladenia carnea*), some leopard orchids (*Diuris pardina*) (below right), and lots of leaves and buds of sun orchids and caladenias.



The writer saw a couple of “giant” bull-ants on her leg, but panicked and didn’t take photos, so they will remain unidentified.

Other plants in flower included milkmaids (*Burchardia umbellata*), bulbine lilies (*Bulbine bulbosa*), pink bells (*Tetratheca ciliata*), myrnongs (*Microseris walteri*) and matted bush-pea (*Pultanaea pedunculata*).

Emily had told us of billy buttons (*Craspedia variabilis*), in flower towards Greenwoods

Lane, but we were so enthralled with everything that we ran out of time to reach them.

If you would like to see all the iNaturalist observations made during this field trip, there is a link to them in a journal post “Clarkesdale in October” on our iNaturalist project:

[https://](https://www.inaturalist.org/projects/fncb-inaturalist)

www.inaturalist.org/projects/fncb-inaturalist

Many thanks to Emily Noble, (who fortunately

loves her work because she never has a day off) for another wonderful field trip!



Vireya Jacquard

Excerpts from Club Meeting Minutes October 7, 2022 held via Zoom

Opening and Apologies

Attendance: President Margaret Rich welcomed 19 members and three visitors. Apology received from V. Hocking.

Syllabus Item: “What influences seasonal Carbon sequestration in Wombat Forest?” We discovered the latest research in this excellent presentation by Nina Hinko-Najera and Ella Plumanns Pouton from University of Melbourne’s School of Ecosystem & Forestry Sciences.

Business Arising from Previous Club Meeting on Sept 4, 2022

Emily sent authorisation to “Regional Victorians Opposed to Duck Shooting Inc.” to use the FNCB logo to indicate our agreement to be a signatory to a letter to the Victorian Premier and Ministers requesting the banning of duck-shooting.

Business Arising from Correspondence:

Discuss renewing FNCB’s membership of Ballarat Environment Network (BEN) for \$25.00.

Motion: That FNCB renew its membership of BEN.

Moved: P. Dalman Seconded: A. Arnold Carried.

Seventh Annual Wildflower Walk at Woowookarung Regional Park is a self-guided, pop-up walk set up from Sunday 23rd to Sunday 30th October. John G offered to lead a mid-week walk for members around the Walk on Thursday 27th October at 2pm, an offer warmly received.

Reports:

Treasurer's Report

Opening bal: \$9,024.91

Income: \$42.92

Expenses: \$298.47

Closing bal: \$8,769.36

Motion: That the Treasurer’s Report be accepted and tabled invoice be approved for payment.

Moved: K. Elder Seconded: J. Gregurke Carried.

Caring for Nature Expo, Sep. 11: John P gave a brief report, noting that a great number of organisations were represented, and a good number of people came along although sadly not many young people, the target audience. Bill thanked & congratulated all FNCB members who participated, many of whom put quite a bit of time into it in the lead-up and on the day.

Reports continued...

Revision of Discovering Ballarat's Bushlands: Carol provided an update from the sub-committee. Eight or nine sites have been provisionally revised so far. A special opportunity to participate was given to members for Thursday October 13 to participate in the revision of Brisbane Ranges National Park.

SEANA Camp: Ten FNCB members attended. There were 6 different excursions for the 80 attendees to choose from. John Gregurke represented our Club at the SEANA General Meeting. Leon Costermans presented a tremendous talk on geology on the Saturday night, as a preview to the book he is hoping to release very soon.

Please note: Club members can order a copy through the Club by the end of November, which will save on postage costs and possibly attract a discount. More details elsewhere in this newsletter.

SEANA have a strong financial position so are looking for environmental projects in which to invest.

Host clubs are already booked in for the next four SEANA Autumn and Spring Camps, with Timboon FNC hosting the next camp in April 2023.

General Business

Our annual Stella Bedggood Memorial Lecture will be held on November 4.

Great Southern BioBlitz, October 28-31, 2022. Several members indicated their interest in getting together with others to undertake BioBlitzes of particular areas, rather than/ in addition to participating as an individual. Emily suggested a couple of locations where the data collected could be particularly useful/ valuable in informing future land management decisions and will email members the proposed dates/ times for a group Bioblitz effort at those sites.

Show & Tell/ Field Reports

Peter and Claire have a pair of Masked Lapwings that started nesting on an exposed gravel area in front of their letterbox a few days ago. Consequently, Peter and Claire get roundly scolded every time they go out, come home or check the letter box.

Andy also showed photos of Masked Lapwings, with the family at his place having three chicks. He thinks they've all safely made it to the wetland over the road.

Carol reported that the Peregrine Falcons in Collins St watchable on YouTube are feeding four chicks. Post-meeting note from Secretary: the Peregrine Falcons are nesting at Devil's Kitchen again too.

Meeting closed: 9.53pm.

Clarkesdale Bird Sanctuary excursion Sunday 9th October 2022

led by Emily Noble

report by Margaret Rich

Photos by Elspeth Swan

Fifteen attendees gathered at Clarkesdale Bird Sanctuary in Linton and set off on the popular Bird Paddock and Lagoon Loop Track. This is where the Sanctuary began, purchased by Gordon Clarke in 1968 in response to his concern over the dwindling numbers of Regent Honeyeaters and many other woodland birds, and donated to BOCA (now BirdLife Australia) in 1976. Aware that these birds favoured the mistletoe in Yellow Box, Gordon determined to preserve and improve the habitat for Regent Honeyeaters and for Painted Honeyeaters, two of his favourite birds. Initially, he planted nectar-rich plants, many native to Western Australia, amongst the Yellow Box, Scentbarks and Candlebarks.

We progressed through the Bird Paddock's delightful Plains Grassy Woodlands, endangered bush that is native to this area. It was carpeted in sundews, Yellow Stars, Blue Stars, Peach Heath, Wallaby Grass, Small Wrinkleworts and Weeping Grass. One special patch had a flowering colony of Small Greencomb Spider-orchids, along with the soft, furry-leaved Austral Bear's Ears, Curved Rice-flowers and Austral Bugles.



Walking with Emily, you learn to look not just for the flowers, but also for the leaves and buds of orchids, lilies and a range of wild-flowers. There were buds galore, promising many flowers soon. We heard Striated Pardalotes singing, the Grey Shrike-thrush and Orioles call, Fan-tailed Cuckoos trilling downwards while the Pallid Cuckoo played his scales with Kookaburras chortling in the background.

There were lots of frogs to listen to as we stopped to look at a Grey Goshawk nest high in a Candlebark. Emily showed us the tree where she had recently spotted an Owlet Nightjar at the entrance of a hollow, enjoying the warmth of the sun.

By the creek, we saw a possum drey. All the while, Les Hanrahan was identifying fungi for us. Walking with a group like this is the best way to learn and fully enjoy the bush.

After lunch back at the Clare Miller Environment Centre, we drove through Devil's Kitchen and parked by Bushranger's Reserve (a Parks Victoria Reserve).

We spent some glorious hours exploring the Jubilee Reserve, an area of Heathy Dry Forest that Gordon Clarke purchased in 1941 and again donated to BOCA in 1976. It is 36 hectares in size and quite different to the areas visited in the morning. In no time we had found Native Violets, Early Nancys, Scented Sundew, Amanita Fungi, Pink Bells, Murnong Daisies and then came across a vast area of Nodding Greenhoods.



Hexagonal vesparia



Caladenia sp.

From there our excitement grew leading us in all directions, calling out our finds, including Pink Fingers, Dwarf Greenhoods, Leopard Orchids and Waxlip Orchids in abundance.

While in the morning we had found so many buds and leaves, we were now coming across flowering plants, coral fungi, and two tiny bird's nest fungi, one complete with "eggs".

We saw where echidnas had been feasting on ants, an old railway cutting where pardalotes nest, and listened to the White-throated Treecreeper and later a kingfisher singing.

It was a day of wonders. Thank you, Emily, and everyone else so willing to share their knowledge on the walks.

Plant List from Clarkesdale Excursion (October 9, 2022)

This is a list of what I noted, and in the order that we saw them
M. Rich, with thanks to Emily for adding the botanical names.

Bird Paddock and Gordon's Lagoon

Understorey

Pink-bells, *Tetratheca ciliata*

Chocolate Lily – buds, *Arthropodium strictum*

Small Pennywort- *Hydrocotyle callicarpa*

Pale Sundew- *Drosera auriculata*

Nodding Greenhood, *Pterostylis nutans*

Peach Heath, *Lissanthe strigosa*

Small Greencomb Spider-orchid – leaves and buds, *Caladenia parva*

Yellow Star, *Pauridia glabella*

Scented Sundew, *Drosera aberrans*

Coral Lichen, *Cladonia retipora*

Australian Buttercup, *Ranunculus lappaceus*

Early Nancy, *Wurmbea dioica*

Small Wrinklewort, *Siloxerus multiflorus*

Blue Squill – buds, *Chamaescilla corymbosa*

Stone Crop, *Crassula sp.*

Pale Sundew, *Drosera auriculata*

Onion orchid – buds, *Microtis sp.*

Creamy Candles, *Stackhousia monogyna*

Ruddyhood orchid – buds, *Pterostylis sp.*

Milkmaid – buds, *Burchardia umbellata*

Weeping grass, *Microlaena stipoides*

Spear Grass, *Austrostipa sp.*

Box Mistletoe fruiting – fruits still green, *Amyema miquelii*

Golden Moth-orchid, *Diuris chryseopsis*

Coral Lichen, *Cladonia retipora*

Austral Bugle (rare in Ballarat area), *Ajuga australis* (see p.11)

Blue Pincushion – leaves and buds, *Brunonia australis*

Austral Bear's ear, *Cymbonotus preissianus*

Common Rice-flower, *Pimelea humilis*

Curved Rice-flower, *Pimelea curviflora*

Small Greencomb Spider-orchid- flowers, *Caladenia parva*

White Punk Fungi, *Laetiporus portentosus*

Grassland Wood-sorrel, *Oxalis perennans*

Tall Sundew, *Drosera peltata*

Lowland Bird-orchid, *Chiloglottis sp. aff. valida*

Bulbine Lily – buds, *Bulbine bulbosa*



Mid-Upperstorey

Yellow Box, *Eucalyptus melliodora*

Ironbark (planted), *Eucalyptus tricarpa*

Red-flowered Yellow Gum (planted), *Eucalyptus leucoxylon*
“Rosea”

Banksia (planted), *Banksia spinulosa*

Scentbark, *Eucalyptus aromaphloia*

Candlebark, *Eucalyptus rubida*

Yarra Gum, *Eucalyptus yarraensis* (critically endangered, FFG)
(See below)

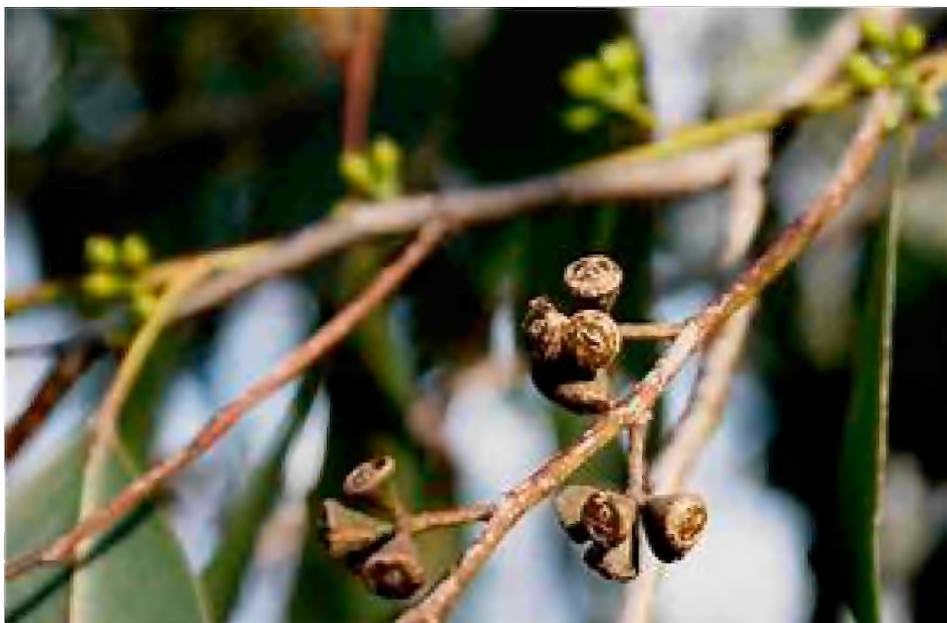
Hakea in flower (planted)

Wattles (planted)

Sweet Bursaria, *Bursaria spinosa*

Correa (planted)

...Continued page 10



Jubilee Block, Clarkesdale

...From page 9

Native Violet, *Viola hederacea*

Early Nancy, *Wurmbea dioica*

Scented Sundew, *Drosera aberrans*

Milkmaid, *Burchardia umbellata*

Amanita Fungi, *Amanita sp.*

Murnong, *Microseris walteri*

Nodding Greenhood, *Pterostylis nutans*

Golden Bush-pea, *Pultenaea humilis*

Common Beard-heath, *Leucopogon virgatus*

Onion Orchid – leaves, *Microtis sp.*

Sun Orchid – leaves and buds, *Thelymitra sp.*

Button Everlasting – buds, *Coronidium scorpioides*

Creamy Candles, *Stackhousia monogyna*

Pink Bells, *Tetratheca ciliata*

Snake (Creeping) Wattle- *Acacia aculeatissima*

Leopard Orchid, *Diuris pardina*

Pink Fingers, *Caladenia carnea*

Yellow Disc Fungi, *Phaeohelotium baileyianum*

Happy Wanderer, *Hardenbergia violacea*

Waxlip Orchid, *Glossodia major*

Small Grass-tree, *Xanthorrhoea minor ssp. lutea*

Black-anther Flax Lily – buds, *Dianella revoluta*

Bird's-nest Fungi (one with "eggs"), *Nidula sp.*

Dwarf Greenhood, *Pterostylis nana*

Common Rice-flower, *Pimelea humilis*

Golden Moth-orchid, *Diuris chryseopsis*

Trailing Goodenia, *Goodenia lanata*

Creeping Bossiaea, *Bossiaea prostrata*

Running Postman, *Kennedia prostrata*

Matted Bush-pea, *Pultenaea pedunculata*

Wattle Mat-rush, *Lomandra filiformis ssp. filiformis*

Spiny-headed Mat-rush, *Lomandra longifolia*

Branching Bluebell, *Wahlenbergia multicaulis*

Narrow-leaf Bitter-pea, *Daviesia leptophylla*

Tussock-grass, *Poa sp.*

Red-anthered Wallaby-grass, *Rytidosperma pallidum*

Red Stringybark, *Eucalyptus macrorhyncha*

Narrow-leaf Peppermint, *Eucalyptus radiata*

Coastal Exposure (Postcard from... Batemans Bay)

For two weeks in August a photography friend and I stayed near Batemans Bay enjoying seascape photography along the coast as far south as Narooma. We picked up a tourist leaflet describing the geology to be seen at various points and planned the days according to tides and times of the day for the right light when possible.

At Bingie Bingie Point a dark basalt dyke had intruded spectacularly into the light-coloured granite (right)



At Guerilla Bay, steeply dipping, highly metamorphosed sediments turned into chert and slate revealed a history of 500 million year-old tectonic forces as continental plates moved. (below)





The same forces gave rise to the Glasshouse Rocks near Narooma, where in addition eroding outcrops of pillow lava were also to be seen in the surf. (above)

At the back of Myrtle Beach the massive strata of the Permian Sydney Sandstone lay unconformably on almost vertical Ordovician slate.

We did of course take “nice pretty” photos too, carefully composed and correctly exposed!! A photobook is forthcoming.

Aside from these explorations we also attended a seminar on post-fire re-growth at the Eurobodalla Regional Botanic Garden – 75% of the shire was deemed severely burnt in the 2019-20 bushfires.

Carol Hall

Attention club members!

If you're out and about, we'd like to hear from you.

Send a “postcard” to us and tell fellow field nats where you've been and what you've seen.

People used to send a postcard to family and friends every time they went away on holiday or a special trip and we seem to have lost that gesture.

Don't forget to include a photo or two, as Carol has done this month.

We look forward to publishing your next adventure in the natural world



Ballarat is well known for its fabulous gardens, and not just the Botanical Gardens near Lake Wendouree.

Gardens in and around Ballarat are featured in this year's Festival of Garden Design. Knowing that many field naturalists are also keen gardeners, this event is sure to be of interest to members.

It is being held over two consecutive weekends in November. You must book and the easiest way to do that is via a web page which also has all the information about the gardens, opening times, etc.

So, visit: <https://gardendesignfest.com.au/tickets/>



Mid-week excursion

Join like-minded members on **November 17** and travel to sites at Mt. Mercer and Illabarook to update information for our revised booklet "Discovering Ballarat's Bushland". We have ordered excellent weather for the day!

Meet at Fed Uni building cnr Gillies St and Gregory St, Wendouree at **9.30 am**. Bring lunch, clothing appropriate to the conditions, notebooks, binoculars, keen eyes, etc.

Every little bit of information will be useful and your enthusiasm will make these outings especially enjoyable and productive too.

What influences carbon sequestration in the Wombat State Forest?

Presented by Ella Plumanns Pouton and Dr Nina Hinko-Najera
School of Ecosystem and Forest Sciences, University of Melbourne

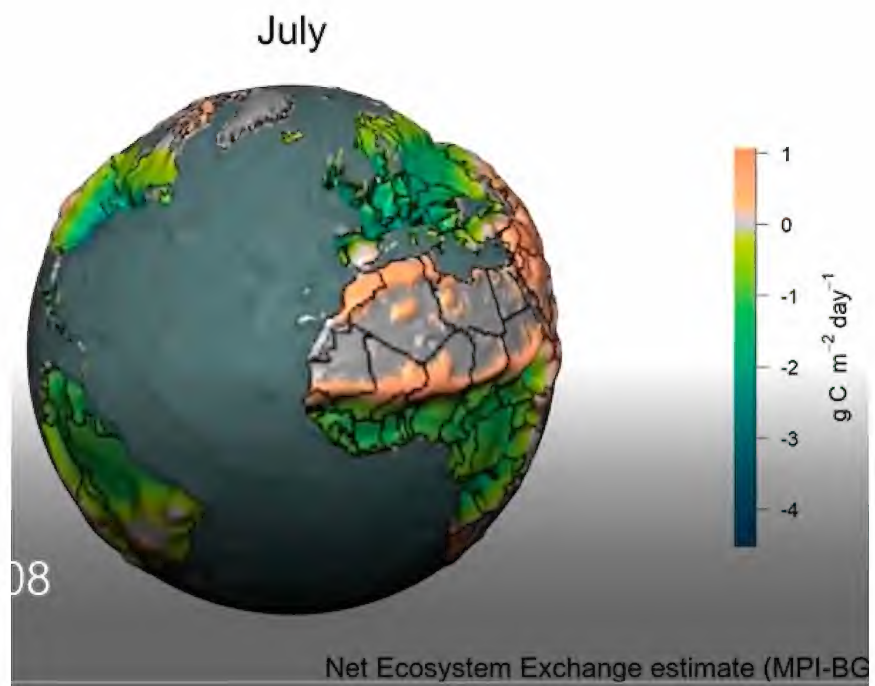
This inspiring and detailed presentation of research conducted from 2013 to 2017 was of great interest. Before describing some of the information related to the presentation, I thought it might be useful to define “Carbon sequestration” because some members, like me, may not be aware of what this term actually means. It is defined as the removal of CO_2 (carbon dioxide) from the atmosphere, either naturally or artificially. This CO_2 is then stored or held somewhere in either solid or liquid form.

So, this research looked at the carbon balance in the Wombat State Forest, the influences at work and the consequences for the environment generally.

Carbon balance is all about measuring the CO_2 in the atmosphere and where it comes from. One basic process in botany is that of photosynthesis whereby CO_2 from the air is taken in by plants and converted to sugars (energy for growth, flowering, etc) and Oxygen is released as a waste product. It will not surprise the reader to learn that much of the world’s CO_2 is held in the atmosphere (48%), while a little less than 30% is held in both the ocean and on land (in vegetation and soils). CO_2 comes from emissions, again not surprisingly from the burning of fossil fuels (gas and coal) (89%) and a smaller amount is related to land use (11%).

There is regular seasonal variation of global concentrations of CO_2 in the atmosphere.

Ella and Nina were able to show this in a particularly graphic way which showed how the earth “breathes”, taking up and releasing CO_2 via vegetation on a seasonal basis.



If you'd like to see this yourself, go to:

https://twitter.com/reichstein_bcg/status/1479108242953363457?lang=en

Furthermore, the graphic also illustrates quite neatly that temperate forests in particular play a major role in this worldwide exchange of CO_2 as opposed to tropical rainforests. Something I did not expect. Even though tropical forests take up huge amounts of carbon, that uptake is almost totally offset by deforestation in the tropics. Temperate forests account for 14% of global forest carbon stored (sequestered) but account for 30% of changes in the global carbon sink, as we saw above.

The study involved a single EC Flux tower (right) and 72 trees fitted with Dendrometers (similar to the one shown below) placed in a variety of sites including some in an area burnt by wildfire in 2009, and others burnt by prescription.



Stem growth is influenced by UV radiation, rainfall, temperature and humidity, nutrients and soil water. There is strong evidence

that stem growth is more sensitive to climatic changes and stress than photosynthesis. In times of stress, photosynthesis continues and carbon is used to maintain the tree's status, but not to grow. Growth rates are influenced by factors such as competition among trees for resources. Other factors include disturbance by fire, wind, and harvest which may have direct and indirect effects such as delayed tree death via disease, or changes in overall forest structure.

Carbon is stored mainly in the stems of large trees in temperate eucalypt forests. By "stems" we are talking about the main trunk of the tree. Therefore, Australia, and especially the south-east corner, has a high potential for large sequestration rates. Eucalypts may be vulnerable to climate change and the researchers wanted to find out more about the tree's responses to things like temperature and climatic conditions. In addition, eucalypts support habitat as well as providing support for human values - from firewood to timbers for building and just plain aesthetics.

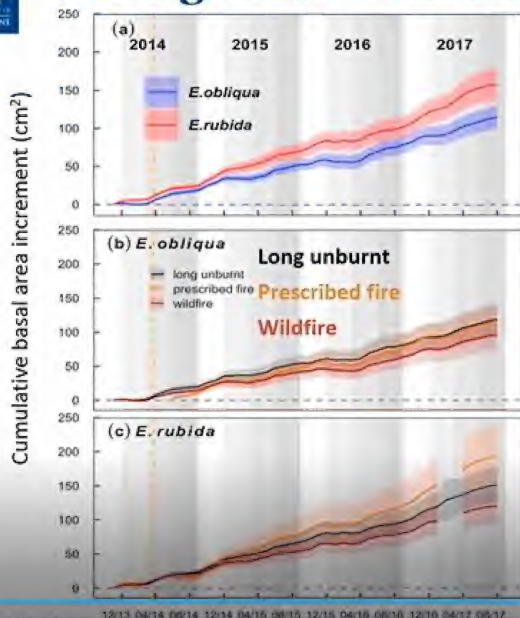
Growth is highly seasonal, at least in younger trees, but studying stem growth in mature trees can be problematic. The accepted method of measuring via growth rings which is brilliant for northern hemisphere deciduous trees is less reliable for eucalypts. Not much data is available because they have poorly-defined growth rings. Also, growth is continuous and it is often driven by conditions that vary throughout the year.

The graphs below illustrate some of the findings of the research:

- ◆ Differences between species
- ◆ Competition and fire history appear to have little or no effect on stem growth
- ◆ Temperature is major factor contributing to stem growth.



Stem growth – climate, competition & fire history



- Strong differences between species:

E. rubida > *E. obliqua*

- NO effect of fire history

- NO to minor effect of competition in (co-) dominant crown classes

- Overall strongest effect: Temperature



A classic illustration of the kind of effects strong winds can have on forest trees as well as man-made structures like the EC Flux tower. This damage in 2021 was so bad that the tower had to be dismantled. Trees were also victims.



The climate of Wombat State Forest is strongly seasonal, as you'd expect. Data collected during the research showed the net result is that Wombat State Forest is a carbon sink, being able to consistently take in more CO² than is released into the environment. Furthermore, the highest levels of CO² uptake occur in summer and are lower in winter.



Stem growth – Take Home Message

- Strong seasonality: peaks of stem growth in **spring & autumn**
- Strongest response to **temperature** *BUT* this varied with season
 - importance of **temperature** and **rainfall** time-lag effects
 - importance of **autumn rainfall** on peak growing seasons
- Strong differences between species *E. rubida* > *E. obliqua* in **spring & summer**
 - E. obliqua* (*Monocalyptus*): more sensitive to higher temperature and less water availability
 - E. rubida* (*Symphyomyrtus*): greater responsiveness & higher temperature optimum

Final take home messages:

- ◆ Tree to tree competition strongly influences and limits growth
- ◆ Climate stress overrides competition
- ◆ If the tree is not stressed by climate then competition has a greater effect
- ◆ Therefore, reducing competition in favourable climates is likely to have the greatest effect
- ◆ A mix of species supports forest growth
- ◆ Species-specific seasonal growth likely key to the successful coexistence of species

Report by Bill Elder

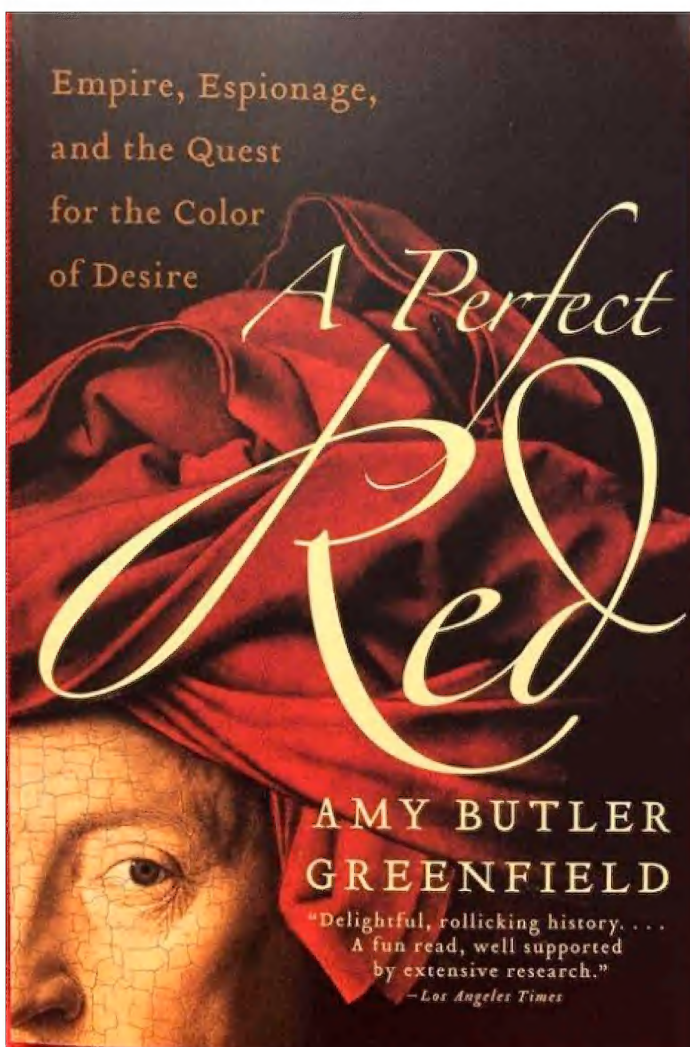
What's wrong here?
I found this little cartoon a while ago and now realise that there are certain biological errors in it...
Can you pick out three of them?

Hint: wings, eyes, body structure.



Book Review - *A Perfect Red*

Amy Butler Greenfield's 2005 book "*A Perfect Red*" is a thrilling read for anyone interested in history, science, and art. Subtitled, "Empire, espionage and the quest for the colour of desire", it is the story of how a tiny insect, native to Mexico, enabled Spain to gain power in Europe and beyond.



Colour in western culture (and indeed most other cultures across the world) is used symbolically. It signifies power, position, privilege and status. Just as the villain in a cowboy movie typically wore a black hat, so colour of clothing in the past was an important social indicator. For instance, purple signified political power and high social status and was worn by senators and emperors in Roman times. This colour was extracted from a humble marine snail (*Murex brandaris*, now renamed *Bolinus brandaris*) conveniently found all around the shores of the Mediterranean Sea.

But, for centuries dyers and cloth manufacturers searched for a red dye that would be "fast". The best dyes were those that would be absorbed by the material and stay bright and even, especially after being washed over and over. Most dyes could be made fast to some degree using a chemical mordant or fixing agent, but often only on certain fabrics. It was difficult to find the combination that remained fast when applied to the largest range of material. Red was a much sought after colour and was usually made with the root of the madder plant (*Rubia tinctorum*), with the addition of alum as a mordant. But, madder red was not ideal and over time the colour faded. More and more, dyers yearned for that "perfect red" – a rich scarlet which signified the height of wealth, power and social status.

Just by chance, the bodily fluids of a small sap-sucking bug, the Cochineal Insect (*Dactylopius coccus*) was found to be a superior source of red that was pure and fast and could be applied to a range of fabrics. These insects were discovered by the Spanish conquistadors in places like Mexico, feeding on the pads of various species of cactus. The Aztecs had used cochineal for ages and used aluminium sulphate as a mordant. The robes of high-status officials, rulers and the like were good evidence for how effective cochineal was.

The Spanish conquerors of Middle America quickly recognised the value of this resource and literally cashed in on the trade and for two hundred years they had a monopoly on the new, improved red.



In an act of industrial espionage in 1777, young French botanist, Nicolas-Joseph Thiéry de Menonville managed to smuggle cochineal-infested cactus pads to Haiti thereby breaking Spain’s lucrative monopoly.

This book is well-written, aimed at the non-scientist and maintains the feel of a fast-paced thriller throughout. It is full of interesting history and science from a number of fields including entomology, chemistry and botany. As a general read on a fascinating subject, I thoroughly recommend it.

Bill Elder

~ ~ ~ ~ ~
~ Cochineal is currently mostly collected on prickly pear plantations in Peru ~
~ and the Canary Islands. Peru is the biggest exporter of this dye, averaging ~
~ 70 tons a year. When you consider that it takes roughly 70,000 cochineal ~
~ insects to create one pound (450g) of dye, that’s a lot of bugs! ~
~ The prickly pear pads are collected and then stored in warehouses, where ~
~ workers gather the bugs off of them. Once removed, they’re sorted and ~
~ then sun-dried. They are then crushed, revealing the bright red colour in- ~
~ side the insect bodies, then mixed with an acidic alcohol solution, which ~
~ brings out the aspects of the dye that will be used. This is why the dye is ~
~ sometimes called cochineal extract. ~
~ Sometimes the dye is mixed with a solution like borax for specific colour ~
~ effects. When this is mixed with water and other fluid substances, the ~
~ resulting dye is incredibly bright red pigment. It also comes in various ~
~ shades of red, making it useful for many different products including food ~
~ and beauty products such as lipstick. ~
~ ~ ~ ~

Excursions and Meetings coming up

(Weather permitting!)

November

Friday 4th: The 2022 Stella Bedggood Memorial Lecture to be presented by John Delpratt, Honorary Fellow of the University of Melbourne. John's topic is "Grassland restoration in Victoria's Volcanic Plains". This event promises to be both informative and highly relevant, being in our backyard, so to speak.

It is also significant as it heralds the return to live, face-to-face meetings, plus you have the option to attend online if you wish. Look out for the Zoom link.

If you come in person we strongly encourage you to wear a mask in the interests of your own health and that of others. If you would like to bring a plate of supper to share or some flowers to decorate tables, that is greatly appreciated and will brighten the room considerably!

Sunday 6th: Excursion to - "Wildflower paddock, Chepstowe", to be led by owner, Neville Oddie. Meet in the Fed Uni carpark, corner Gillies St & Gregory St, Wendouree for convoy and departure at 9.30am sharp OR meet at "Chepstowe" RMB 435-436 Streatham-Carngham Rd at 10am. Park outside on the nature strip.

We will spend 2 hours at the property, then move to the Lake Goldsmith Game Reserve for lunch. There are plans to visit other places of interest in the afternoon, so be prepared for anything!

Bring camp chairs, camera, binoculars, field guides, thermos, morning tea, lunch and afternoon tea, and dress to suit the weather.

Committee

President	Margaret Rich
Secretary	Emily Noble
Treasurer	Kathy Elder
Committee	Andy Arnold
	Bill Elder
	Val Hocking
	Graeme Lunt
	John Petheram

Correspondence: PO Box 328W, Ballarat West, 3350

Email: Secretary: Emily Noble

Editor: Bill Elder

Treasurer Kathy Elder

Website: <http://fieldnatballarat.wordpress.com>

Club email: ballaratfnc@gmail.com

Meetings - may continue to be held via Zoom.

Members will be kept informed of arrangements each month.

A monthly publication of the Field Naturalists' Club of Ballarat Inc.
Incorporation # A0014919P ABN 13 150 403 135